



Hydro-sedimentary characterization of Cointzio and Umécuaro dams

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The aim of this work is to assess the hydrosedimentary state of the Umécuaro and Cointzio reservoirs. It complements previous studies that have principally focused on the health of this ecological system. They're located in the upper section of the Rio Grande de Morelia River (Michoacan, Mexico), in a watershed suffering from a growing human impact. The Umécuaro reservoir (elevation: 2204m) is a small water body, in a natural protected area, built to supply water to surrounding villages. The Cointzio reservoir (at an elevation of 1860m), 20Km downstream, provides water for human and industrial uses to the expanding city of Morelia. Investigations were made in December, at high water level. They consisted of extensive echo-sounding measurements, bottom sampling, vertical and subsurface measurements of turbidity, temperature and conductivity. Two main results were obtained. First, the analysis of the new bathymetric map shows the recent sedimentation rates and their distribution. This information will be particularly useful for management of the Cointzio reservoir. This study also revealed a very different hydro-sedimentary behaviour between these two reservoirs. Umécuaro was characterised by transparent waters (0 to 10 NTU), allowing light penetration with observable impact on the biological activity. In contrast to this, the entire reservoir of Cointzio presented highly turbid (170-180 NTU) and mineralised waters, in spite of a weak sediment discharge by the Rio Grande. These differences in water quality reveal that the main tributaries feeding the reservoir of Cointzio are very local. The input of sediment seems related to the environmental deteriorations downstream of Umécuaro and to the growing human impact close to the reservoir. A second campaign will be carried out at low water level, to complete this study and identify clearly the activities at the origin of this environmental gradient.